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Sources of IT dynamic capability in the context of data genesis capability

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THE IMPACT OF LEARNING CULTURE AND INFORMATION TECHNOLOGY USE ON KNOWLEDGE-SHARING: A CASE OF KFUPM

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Abstract

Nowadays Knowledge is regarded as a strategic resource in organizations, and thus the leverage of knowledge is a key managerial issue. Knowledge creation, sharing and dissemination are the main activities in knowledge management. This study examines the influence the social and technological factors such as learning culture and IT use, could have on knowledge sharing of King Fahd University of Petroleum and Minerals (KFUPM) students. A cross-sectional survey was used as a methodology for data collection and 137 valid responses were collected from all the three categories of students that include graduates, undergraduates and preparatory students. The study shows that there is a significant positive relationship between the student learning culture and IT use on student knowledge sharing. The study limitations, practical implications, along with directions for further research are discussed.

Key words: knowledge sharing, learning culture, IT use, knowledge management

1. INTRODUCTION

Knowledge is recognized not only as the most important resource in organizations (Liao et al. 2004) but as one of the primary sources of competitive advantage (Stewart 1996). Knowledge is critical to the long term sustainability and success of any organization (Nonaka and Takeuchi 1995). The importance of knowledge is eminent to both public and private organizations, particularly educational/learning institutions such as universities (John 2001). The leverage of knowledge is a managerial and strategic issue. As reservoir of knowledge, higher learning institutions are no longer just providing knowledge to students, but also managing and blending together as well as sharing such knowledge among the students. Thus, knowledge sharing is inevitably challenging and important concept in higher learning institutions.

Knowledge creation, sharing and dissemination are the main activities in knowledge management. Being part of knowledge management (KM) process (Kim and King 2004), Knowledge sharing (KS) is the exchange of experience, events, thoughts or understanding of anything. In general, people expectations from knowledge sharing are to gain more insights and understanding about concepts or practical applications, thereby improving learning and expertise. Thus, knowledge sharing can be considered as a significant ingredient for mutual learning and intellectual development to students.

To stay competitive in the education industry, institutional members must promote knowledge sharing (Kumar 2005). Conversely, the competitive nature of learning institutions, among others, may hinder the knowledge sharing among the students. Thus, studies on both barriers and enablers of knowledge sharing in learning institutions may be relevant not only for adding to the literature, but to the policy makers of such institutions. Literature search shows that limited studies were available on the factors that promote and limit knowledge sharing among students.

With the increasing investment of Information Technology (IT) in educational institutions, one expects such investments to have positive impact on the way knowledge is disseminated. Possibly, the level as well as the use of Information Technology (IT) may support knowledge sharing capabilities (Ipe 2003) in institutions of learning. However, investment in technology may not be the only factor that could enable

knowledge sharing. Other factors, social and cultural, in particular are worth considering. In this respect, support of one another, learning culture, might in a collectivistic society, like Saudi Arabia, promotes the willingness of students to share knowledge among themselves (Maccoby 2003).

Literature search shows that limited studies were available on the factors that promote and limit knowledge sharing among students. Similarly, the literature search revealed that, to date, no such study was undertaken in Saudi Arabia. Hence, the focus of this study is to examine the relationship of some dimensions of learning culture and Information Technology (IT) on students' knowledge sharing.

This study is unique and original, not only for being one of the first in Saudi Arabia, but for being one of the few that examines how both technological and social and cultural factors together serve as antecedents of knowledge sharing. Next, the research objectives and significance of the study will be presented. Then, section two examines the relevant literature. Section three discusses the research methodology. Section four provides findings and implications. Finally, section five concludes the paper and recommends future research directions.

1.1 Objectives of the Study

In a bid to assess the impact of learning culture and use of information technology on students' knowledge sharing in KFUPM, the study specifically aims at:

1. Determining the impact of learning culture on the students' knowledge sharing.
2. Evaluating the role of IT on students' knowledge sharing.
3. Assessing the level of knowledge sharing and learning culture of the KFUPM students and
4. Assessing whether knowledge sharing and learning culture differ among demographics of KFUPM students.

1.2 Significance of the Study

Literature search revealed that, to date, no research has been conducted on the role of learning culture and use of IT in promoting knowledge sharing in the Kingdom of Saudi Arabia. Thus, the result of this study may be relevant to various stakeholders in the Kingdom. To the government authorities of education in the Kingdom, the understanding of how knowledge is been shared (Brown and Duguid 2000) is important in attaining the government strategic plan of transforming the country to knowledge-based economy. Hence, the findings of the study with respect to the level of the knowledge sharing will be of great significance to this end.

The management of KFUPM may also find the results of the study of immense practical benefits because there is a need, in the first place, to know those factors that impact knowledge sharing among students before embarking on any strategy and program of supporting knowledge management in the university. From an academic perspective, this study's insights will add to the existing literature on the impact of learning culture and IT use on knowledge sharing in general; and in Saudi Arabia in particular where none exist. Therefore, the study is of significant value to practitioners and scholars alike.

2. LITERATURE REVIEW

2.1 Knowledge Sharing

Organizational success in today's dynamic and fiercely competitive environment depends largely on the ability to leverage knowledge to develop competitive capabilities to aid in developing new products, services and processes that outperform those of rivals (Kogut and Udo 1992, Nickerson and Zenger 2004,

Szulanski 1996). Knowledge is regarded as a fluid mix of framed experiences, values, contextual information, and expert insights that provide a framework for evaluating and incorporating new experiences and information (Davenport 1997). Many other definitions are abound (Davenport 1997). With respect to categorization of knowledge, there is no consensus in this regard. Researchers have identified different types of knowledge (Nonaka and Takeuchi 1995). The most common classification, however, is between explicit and tacit knowledge (Nonaka 1994).

While it is easy to transmit explicit knowledge through formal language, it is much difficult on the other hand to convey tacit knowledge (Nonaka and Takeuchi 1995). This is because explicit knowledge can be made readily available in the form of files, library collections, or databases (Nonaka and Takeuchi 1995). However, tacit knowledge is difficult to express in words or to codify in documentation. It mainly resides inside individuals' brains (Hlupic and Rzevski 2002). It is the personal knowledge that is embedded in individual members and used by them in performing their work (Argote and Paul 2000).

It should be noted that knowledge is not an end in itself, but rather means to an end. Thus, only by harnessing and exploiting the collective wisdom and knowledge of their members can organizations adapt and develop innovative processes, products, tactics and strategies (Alavi et al. 2005/2006, Maccoby 2003). A technique widely championed by organizations in order to achieve this end is knowledge management. Knowledge management demands that knowledge should be obtained, produced, shared, regulated and leveraged by a steady conglomeration of individuals, processes and IT (Benbya and Belbaly 2005). Knowledge sharing, as a dimension of knowledge management, is in turn defined as the provision or receipt of task information, know-how and feedback regarding a product or procedure (Cummings 2004).

Knowledge sharing can also be seen as a social interaction culture, involving the exchange of employees' knowledge, experiences, and skills through the whole department or organization. Knowledge sharing comprises a set of shared understandings related to providing employees access to relevant information and building and using knowledge networks within organizations (Hogel et al. 2003). It is the voluntary dissemination of acquired skills and experience to the rest of the organization (Ipe 2003).

At the individual level, knowledge sharing is referred to as the talking to colleagues to help one get something done better, more quickly, or more efficiently (Lin 2007). Sharing of knowledge at the individual level is the most critical to an organization, even though it may exist at other levels of an organization that include team and organizational levels (Lukas et al. 1996). Individuals can realize synergistic results greater than those achievable individually by sharing their knowledge (Cordoba and Isabel 2004).

Moreover, knowledge sharing occurs not only at the individual level, but at the organizational level as well (Lin 2007). For an organization, knowledge sharing is capturing, organizing, and transferring experience-based knowledge that resides within the organization and making that knowledge available to others in the organization (Lin 2007). A firm can successfully achieve promotion of knowledge sharing culture not only by directly incorporating knowledge in its business strategy, but also by changing employee attitudes and behaviors to promote willingness and consistent knowledge sharing (Connelly and Kelloway 2003, Lin and Lee 2004).

There are several antecedences, organizational and otherwise, to knowledge sharing. These factors include the organizational structure, organizational culture, leadership, information systems (Davenport and Prusak 1998, Bock, et al. 2005, Ardichvili et al. 2006), avoidance of embarrassment (Burgess 2005), obligation, trust, and identification (Faraj and Wasko 2002), individual ability (e.g. subject expertise, tenure) (Wasko and Faraj 2005), greed, self-efficacy (Lu et al. 2006), extrinsic rewards, fear of punishment (Burgess 2005), expected rewards, expected associations, expected contribution (Bock and Kim 2002), perceived costs, extrinsic benefits, intrinsic benefits (Kankanhalli et al., 2005), anticipated extrinsic rewards, anticipated reciprocal relationships, sense of self-worth (Bock et al. 2005) among

others. The outcome of knowledge sharing that includes productivity, task completion time, organizational learning (Argote 1999, Argote et al. 2000, Cummings 2004), enhancing innovation performance and reducing redundant learning efforts (Scarborough 2003) have been examined by a number of studies. Conversely, the absence of knowledge sharing is likely to undermine knowledge management efforts (Calantone et al. 2002).

2.2 Learning Culture

Both private and public organizations are increasingly recognizing the importance of culture as an essential prerequisite for readiness and willingness to learn (Calantone 2002). Simply, culture can be referred to as a system of shared values and assumptions. It influences employee interaction, organizational functioning, and even decision making in organizational settings (Lukas et al. 1996). Culture is of great importance to the learning organizations including universities (Carleton 1997). It influences or inhibits, directly, the quality of learning (Szulanski 1996), which is of utmost concern in institutions of higher education.

According to Johnston and Hawke (2002), learning culture can be defined as the existence of a set of attitudes, values and practices within an organization which support and encourage a continuing process of learning for the organization and/or its members. A learning culture is said to exist in an environment where teamwork, collaboration, creativity, and knowledge processes exist that have a collective meaning and value (Joo 2007). For an organization to improve its performance, it requires a learning culture (Kumar 2005). Hence, development of learning culture is becoming a dominant theme in the strategic plans of many organizations today (Walsham 2002).

Developing a learning culture could help in gathering, organizing, sharing, and analyzing the knowledge of individuals and groups across an institution in ways that directly affect its performance (Kumar 2005). Learning culture benefits a whole organization and certain teams within the organization and it is essential in moving an organization to a learning one (Cohen 1990) which usually support knowledge sharing. Researches that focused on factors affecting knowledge sharing have identified the relevance of learning culture, among other variables (John 2001). In higher educational institutions, in particular, learning culture is needed for the institutions to create and disseminate knowledge that is necessary for the development of such institutions. Development of such learning culture in learning institutions may also create opportunities in accessing and sharing the right knowledge at the right time and in the right location to stay competitive in the global educational environment (Kumar 2005). Hence, it can be hypothesized that:

H1: The level of learning culture has positive effect on students' knowledge-sharing behavior.

2.3 Information Technology

The role of the information technology (IT) in sharing knowledge has been a center of debate (Maccoby 2003). While some investigators are of the opinion that knowledge management (KM) initiatives could be successful without using IT tools (Mohamed 2006, Hislop 2002), other researchers have, however, identified IT as a variable that could impact knowledge sharing (Huysman and Wulf 2006) for the fact that technology is one of the important pillars of knowledge management (Maccoby 2003). Haldin-Herrgard (2000) maintained that a great deal can be done through modern IT to diffuse explicit knowledge. It is also becoming easier nowadays to capture tacit knowledge with the aid of retrieval technologies (Kumar 2005).

A study by Pai (2006) that examined the relationship between the effectiveness of IS strategic planning (ISSP) and knowledge sharing found that top management support for ISSP has a strong significant effect

on knowledge sharing behavior. A separate study in South Korea by Kim and Lee (1996) also found, among others, that both employees' usage of IT applications and friendliness of the IT systems significantly impact employee knowledge-sharing capabilities. It can, therefore, be expected that individuals with more usage and favorable perception of IT may demonstrate more knowledge sharing behavior (Kumar 2005). Hence, it can be hypothesized that:

H2: The level of students' utilization of IT has a positive effect on students' knowledge-sharing behavior.

Based on the study objectives which were substantiated by the reviewed literature, the hypotheses of the study are eventually developed. These hypotheses are translated into the theoretical model depicted in Figure 1. The model presumes that learning culture and IT use have an impact on students' knowledge sharing in KFUPM.

3. METHODOLOGY

3.1 Data Collection and sample

In a bid to examine the impact of learning culture and IT use on students' knowledge sharing in KFUPM, the study undertook a survey questionnaire method. The survey instrument reflected the conceptual framework depicted in Figure 1.

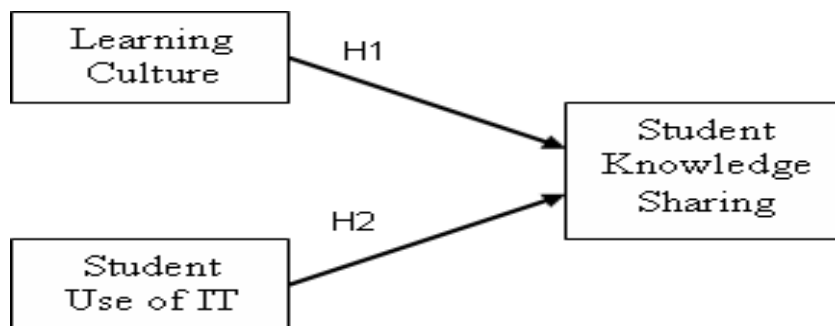


Figure 1. Conceptual Model

To ensure generalization of the study findings, the questionnaires were administered based on stratified random sampling to KFUPM students. A total of 200 surveys were hand-delivered to the graduates, undergraduates and preparatory students from all the academic departments in the University. A total of 142 questionnaires were returned; of which five incompletes were discarded. The final number of usable questionnaires was 137, representing 68.5% response rate.

3.2 Measures

All the constructs of the study were measured from items adapted from previous studies, with some alterations to account for the peculiarity and setting of the study. To improve the reliability and validity, multiple-item measures were used for all of the variables. Responses were recorded along a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) for all the items in the questionnaire. Learning culture was measured using 6 items adopted from Cordoba and Isabel (2004). The six items were meant to be grouped into meaningful cluster(s) by conducting factor analysis. Students' IT usage was measured using 6 items from Kim and Lee (1996) and 1 item specifically designed for this study was added. Finally 6 items were adapted from Kim and Lee (1996) as a measure of students' knowledge-sharing.

4. STUDY FINDINGS AND IMPLICATIONS

4.1 Profile of the Respondents

The survey questionnaires were distributed to each of the three categories of students, graduates, undergraduates and preparatory students. Preparatory students are those students that are undergoing one year course toward starting their main bachelor degree. Undergraduates are those that are pursuing their four year bachelor degree courses. Both the preparatory and the undergraduate students are from different regions of the country, which makes the sample relatively homogeneous. On the other hand, graduate students are those students pursuing their postgraduate programs that include MBA, MS and PhD. The unique characteristic of the graduate students of the university is that they include students from different countries, not only from Saudi. The cosmopolitan nature of this category of the students may reflect the perception of students across different societies, hence enabling the study findings to be more generalized.

It can be inferred from Table 1, that 30.15% of the respondents were graduate students, 63.97% undergraduates, and the remaining 5.88% preparatory students. With respect to the GPA, it can be seen that only about 15% of the respondents have GPA of more than 3.75 and 16% with GPA of 3.51 - 3.75. On the other hand, over 50% of the respondents' GPA is between 3.00 - 3.25 and less than 3.00. This seems to be quite representative of the population.

	No of Valid Respondents	Percent	Cumulative Percent
<i>Categorization</i>			
Graduate student	41	30.15	30.15
Undergraduate students	87	63.97	94.12
Preparatory student	8	5.88	100.00
<i>GPA</i>			
3.76 – 4.00	13	14.44	14.44
3.51 – 3.75	16	17.78	32.22
3.26 – 3.50	15	16.67	48.89
3.00 – 3.25	26	28.89	77.78
Less than 3	20	22.22	100.00

Table 1. Respondents' Profile

4.2 Reliability and Validity of Variables

Several major steps were carried out to enhance the reliability and validity of the variables. Factor analysis was first made for this purpose. Reliability was then utilized to check the internal consistency of the scales involved in the study. Coefficient alpha analysis was used to determine the extent to which items making up each measure were homogenous and loaded on the same scale (Allen and Yen 1979). Cronbach's alpha has been suggested to be the preferable measure of index reliability. The scales used in this study were checked for their internal consistency.

Content Validity which determines the adequacy of the sample characteristics in describing the study measures (Nunnally 1978) has been established in the study. This is because the questionnaire used in this study built upon existing research where the scale items were found to be valid. For the construct validity, one technique widely used to assess such validity of an instrument is factor analysis (Kerlinger 1973). Various items that represent each dimension were analyzed to see if they are properly assigned to the appropriated scale (Carmines and Zeller 1980). Two criteria were used to identify the factor scales. First, all scale items that loaded less than 0.40 were removed. Second, a construct with the highest eigen value

would be represented by a factor. For the learning culture, all the items were found to be correlated with the factorial groups produced with the factor loading more than 0.40. Out of the 6 items, two factors emerged as can be seen in Table 2. The correlation result between these factors shows that the two factors are significantly correlated at 99% level of confidence. Thus, one factor was selected that represent the learning culture construct and named learning culture in KFUPM. This factor is the one with the highest eigen value of 2.844 and the percentage variance explained of 47.403 as depicted in Table 2.

Item	Factor 1	Factor 2
1. KFUPM has a great deal of personal meaning to me	0.816	
2. I owe a great deal to KFUPM	0.888	
3. I am willing to work with one another in KFUPM	0.673	
4. I am willing to ask others for assistance (e.g information, etc) in KFUPM	0.613	
5. I feel safe sharing information/knowledge with my colleagues		0.879
6. I can trust my colleagues		0.812
Eigen Value	2.844	1.159
Variance explained (%)	47.403	19.316
Pearson Correlation	1	.389**
		.000
Pearson Correlation	.389**	1
	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2. Correlation of Learning Culture Factors

From Table 3, it is evident that the Cronbach's alpha of the construct, learning culture in KFUM is 0.777. Since according to the guideline of Nunnally and Bernstein (1994) the value of 0.7 or above is an acceptable reliability coefficient, hence the construct has exhibited adequate reliability. With respect to the Students' IT usage, the result of the factor analysis indicates that one item has less than 0.40 factor loading. The item was hence dropped. The remaining five items eventually yielded a single factor with 0.678 Cronbach's alpha. Though the Cronbach's alpha not up to 0.70, the factor could still be considered reliable since it very close to .70 (Koch et al. 2005, Graham and Nafukho 2007, Chang and Lin 2007). Some of the items used for measuring IT use are those provided by the university (KFUPM) such as the WebCT, and other systems that are specifically designed by the university authority to promote learning. Other IT items used by students for knowledge sharing and learning include the email tools available in KFUPM Intranet and the Internet. Similar to IT usage, one item of the knowledge sharing has less than 0.40 factor loading value. The item was dropped and the remaining 5 items yielded one factor. The Cronbach's alpha reliability for these five items was 0.744, which can be considered quite reliable (Nunnally 1978).

4.3 Study Findings

Recall that the first and the second objectives of the study are to determine the impact of each of the learning culture and IT use on students' knowledge sharing respectively. Since the appropriate analysis that assesses the influence of independent variable(s) on dependence variable is regression analysis, two simple regression analyses were run to test the two proposed hypotheses. The choice of the simple regression analysis in assessing the impact of both learning culture and IT use on the dependent variable is that each of the two variables has a single dimension. Moreover, The R^2 of both learning culture and IT use models explains knowledge sharing behavior of students in KFUPM. From the results of the regression in Table 4, it can be deduced that the learning culture in KFUPM, which has a positive

coefficient Beta, as hypothesized has significant relationship with students' knowledge sharing. Hence, the first hypothesis is fully supported that learning culture has positive impact on the students' knowledge sharing in KFUPM.

Constructs and Items	Standard Loading
Learning Culture in KFUPM Construct Items	
I owe a great deal to KFUPM	0.888
I am willing to work with one another in KFUPM	0.673
I am willing to ask others for assistance (e.g information, etc) in KFUPM	0.613
KFUPM has a great deal of personal meaning to me	0.816
Cronbach's alpha	0.777
Information Technology (IT) Usage Construct Items	
I regularly use the Internet, e-mail, and electronic bulletin boards	0.638
I regularly use the KFUPM's intranet	0.609
I regularly use the KFUPM's content delivery system (eg. Webct etc).	0.702
In this university, information systems and software are designed to be user-friendly.	0.703
It is easy for me to use the university's information systems without extra training.	0.664
Cronbach's alpha	0.678
Knowledge-Sharing Construct Items	
I voluntarily share my know-how, information, and knowledge with other students	0.766
I freely share information and knowledge that will improve the academic performance of fellow students	0.809
I cooperate or communicate with other students in teams or groups for sharing information and knowledge	0.764
I discuss my academic problems with other students rather than struggling with the problems individually	0.541
I share information and knowledge in the class/group if I know the information/knowledge will help in the understanding of other members of the class/group	0.611
Cronbach's alpha	0.744

Table 3. Significant Factor Analysis and Reliability Analysis Results

Similar finding was achieved from the regression analysis result in same Table 4 of the positive influence of IT use on the students' knowledge sharing in KFUPM. The second hypothesis is equally supported. Furthermore, the R^2 of the two regression models, which are 0.487 and 0.151, indicate that 48.7% and 15.1% of the overall student knowledge sharing is explained by the learning culture and IT use independent variables respectively.

Construct	Beta	t	Sig.	R^2	F	Sig
Learning Culture in KFUPM	0.352	4.610	0.000	0.487	41.61	0.00
Information Technology	0.388	4.897	0.000	0.151	23.98	0.00

a. Predictors: (Constant), Learning Culture in KFUPM, information technology b. Dependent Variable: Knowledge Sharing

Table 4. Summary of Regression Analysis

Furthermore, the result of regression in Table 5 shows which Information Technologies items more used for knowledge sharing. It can be inferred that the coefficient (beta value) of the item "It is easy for me to use the university's information systems without extra training" is higher showing this IT items contributes more to knowledge sharing and the least item that impact knowledge sharing is "I regularly use the KFUPM's databases (e.g., library e-database, etc)".

IT Items	Beta	t	Sig.
I regularly use the Internet, e-mail, and electronic bulletin boards	.267	2.907	.004
I regularly use the KFUPM's intranet	-.112	-1.151	.252
I regularly use the KFUPM's databases (e.g library e-database, etc)	.020	.219	.827
In this university, information systems and software are designed to be user-friendly.	.137	1.431	.155
It is easy for me to use the university's information systems without extra training.	.286	2.950	.004

a. Predictors: Information Technology Items b. Dependent Variable: Knowledge Sharing

Table 5. Summary of Regression Analysis

To answer the research question of the level of knowledge sharing and the learning culture of the students, one-sample *t* test analysis was undertaken. Since the scales for knowledge sharing and learning culture are all on 5 point Likert scales, the test value of 3 was used and the result in Table 6 shows that all the means are significantly different from neutral value 3. These findings indicate that the students are more inclined toward satisfaction than dissatisfaction with both the knowledge sharing and the learning culture.

Test Value = 3				
	Means	t	df	Sig. (2-tailed)
Knowledge-Sharing	3.76	13.53	136	0.00
Learning Culture in KFUPM	3.81	11.92	136	0.00

Note: Mean scores based on a five-point scale ranging from 1 = Strongly Disagree to 5 = Strongly Disagree.

Table 6. One-Sample Test of Level of Knowledge Sharing and Learning Culture

The last research objective aims at examining how the learning culture and the knowledge sharing of the students differ according to the demographics. The results of the ANOVA in Table 7 below report such relationships. The results indicate that the level of the knowledge sharing among students is not significantly different with respect to both the students' GPA and their category because the $p > 0.05$. This implies that the students share knowledge irrespective of their GPA or their category. However, with respect to the learning culture in KFUPM, ANOVA results in Table 6 show that the level of learning culture in KFUPM is significantly different among students with different class of GPA, though no significance difference exists between different categories of students.

ANOVA Summary Statistics		
	F	P
Categorization		
Knowledge Sharing	2.137	0.122
Learning culture in KFUPM	2.85	0.06
GPA		
Knowledge Sharing	0.417	0.796
Learning culture in KFUPM	2.75	0.03

Notes: F-values are the result of a one-way ANOVA at $p < 0.05$ level of significance.

Table 7. ANOVA of Categorization and GPA with the Study Constructs

4.4 Discussions and Implications

The findings of the study of the impact of both learning culture and IT use on knowledge sharing among students has important implications to the management of KFUPM as well as other sister institutions. The reason is that because in their effort to enhance knowledge sharing which is inevitable in promoting learning (Graham and Nafukho 2007, Haldin-Herrgard 2000) the management of KFUPM and other higher institutions should opt to at least instill the culture of learning as well as invest more in IT and ensure more usage of IT by their students.

The finding of learning culture as a contributor to knowledge sharing shows that knowledge sharing factors do not depend solely on technology. In fact, the study finding that learning culture accounts by about 48.7% to knowledge sharing against IT use that accounts by only 15.1% is of practical implication and implies that effort toward promoting learning culture may be more viable in promoting sense of knowledge sharing between the students. To achieve this, there is need to organize some orientation courses, seminars among others to instill the etiquette of positive learning culture in the students. It can be envisaged that it may be wise to consider integrating learning culture in the course syllabi design. In the same vein, the finding with respect to the demographics that level of the knowledge sharing of the students is the same irrespective of their GPA and their category implies that, when designing a knowledge sharing program it can be standardized to all students in the university.

5. CONCLUSIONS AND FUTURE RESEARCH

Based on the study results and discussion, it could be concluded that the usage of IT and learning culture are significant variables that affect student knowledge sharing in higher institutions, and KFUPM in particular. The presence of learning culture as the major contributor shows that knowledge sharing factors do not depend on technology alone. It is suggested that in a bid to improve student knowledge sharing, the appropriate authorities and decision makers need to commit efforts and programs that could enhance learning culture and IT usage among students. In spite of the originality of this study for being one of the few that examined the influence of social and technological factors together, learning culture and IT use, on student knowledge sharing in the Kingdom of Saudi Arabia, it suffers from some limitations that are common to many other researches.

One of the chief limitations is that the sample size is relatively small and needs to be increased. To account for the sample size limitations of the study, further studies can consider respondents from several universities, possibly including female respondents, to ensure more generality of the findings. In addition to the learning culture, further studies can expand this study to include other factors that may impact students' knowledge sharing. Also, the impact of IT on collaborative learning is another area where further research could be viable.

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